SIP RACT Analysis for Kennecott Bingham Canyon Mine and Copperton Concentrator

The Kennecott Utah Copper (KUC) Bingham Canyon Mine (BCM) and Copperton Concentrator (CC) are located in Salt Lake County, Utah, near the town of Copperton. The BCM is currently operating under Approval Order (AO) DAQE AN105710028-11, issued on June 27, 2011. This AO increased the total material moved limitation to 260,000,000 tpy of ore and waste rock combined on an annual basis to maintain the current levels of metal production. A BACT analysis was performed for all sources of emissions during the review for the AO modification. The emissions from the existing mobile and stationary equipment were recalculated to maintain consistent methodology using the most current emission factors. The CC is operating under the AO DAQE-AN105710030-11, issued on September 8, 2011.

Starting in August 2011 DAQ held several meetings with KUC to discuss the $PM_{2.5}$ SIP and the required RACT analysis. KUC submitted a RACT analysis on December 12, 2011. This RACT analysis was reviewed by DAQ and submitted comments to KUC. KUC submitted a revised analysis on March 6, 2012. DAQ reviewed this RACT analysis. KUC submitted a final RACT analysis on August 9, 2012. DAQ agrees with the final RACT analysis submitted by KUC.

The potential to emit at the BCM and CC are as follows:

	PM_{10}	$PM_{2.5}$	NO_x	SO_2	VOC	CO
BCM	1,513	368	5,830	7	314	1,682
CC	34.62	25.5	10.66	0.1	4.04	9.87

The sources reviewed for RACT at the BCM are outlined below:

Disturbed Areas: These include disturbed areas for mining and other related activities and consist primarily of windblown fugitive dust emissions. KUC current practices include revegetation of the areas as soon as practical to minimize dust.
DAQ accepts the current practice of revegetation as the most effective means of reducing emissions.

Truck Loading: Consists of loading ore and waste rock material into trucks minimizing the height of the drop. Emissions are fugitive dust from the transferring of the material.
DAQ accepts the practice of minimizing drop distances as the most effective means in controlling loading emissions. Additionally, inherent material characteristics like moisture content and large diameter size of the material also assists in reducing emissions.

End Dump Trucks: Haul trucks dump waste rock or overburden at the waste rock dump areas minimizing the height of the drop. Emissions are fugitive dust from the transferring of the material.
DAQ accepts the practice of minimizing drop distances as the most effective means in controlling loading emissions. Additionally, inherent material characteristics like moisture content and large diameter size of the material also assists in reducing emissions.

Truck Offloading Ore at the In-pit Crushers: Haul trucks dump ore directly into the crusher building located within the pit. The transfer point is fully enclosed to reduce wind exposure when offloading. Emissions are fugitive dust from the transferring of the material.
DAQ accepts the practice of using enclosures as the most effective means in reducing emissions. Additionally, inherent material characteristics like moisture content and large diameter size of the material also assists in reducing emissions.

Graders: The graders primarily operate on the haul roads maintaining surfaces of the roads. Emissions are fugitive dust from the grader blade and wheels contacting the road surface. Particulate emissions are controlled by the application of water to the roads.
DAQ accepts the practice of using water to control and minimize the fugitive emissions generated by grading the roads.

Front End Loaders: Larger loaders are used to transfer ore and overburden; smaller loaders operate in and out of the pit primarily with the small haul trucks on haul road construction and cleanup projects. Emissions are fugitive dust from the transferring of material and wheels contacting the road surface. Particulate emissions are controlled by the application of water to the roads.
DAQ accepts the current operating practice at the BCM as RACT for using loaders to transfer material.

Unpaved Haul Roads: Haul roads are used by the haul trucks to transfer ore and waste rock from the digging face to the waste rock piles and in-pit ore crusher. Dust from the haul roads is controlled by water trucks applying water and chemical dust suppressants on the roads and maintaining a good road base of course gravel.
DAQ accepts the current practice of using water on the haul roads inside the pit, and water and chemical dust suppressants outside the pit to control fugitive dust from haul roads.

Tailpipe Emissions from Haul Trucks and Support Equipment: Tailpipe emissions are from haul trucks and support equipment such as graders and dozers. Tailpipe emissions from the haul trucks and support equipment meet the required EPA standards for NONROAD equipment.
DAQ accepts the EPA equipment standards for RACT.

Fueling Stations: Onsite refueling stations for vehicles, support equipment and blasting. Emissions are released by adding gasoline and diesel to storage tanks and dispensing from the storage tanks into vehicles. The fueling operation is equipped with Stage 1 and Stage 2 vapor recovery systems.
DAQ accepts the stage 1 and stage 2 vapor recovery as RACT.

Solvent Extraction/Electrowinning (SX/EW) Plant: The SX/EW process consists of mixers and settlers for the extraction and stripping of copper; organic surge and holding tanks; and raffinate and electrolyte circuits causing agitation of organic solutions. Tanks are covered and an acid mist eliminator is used to control emissions from the electrowinning cells.
DAQ accepts the use of tank covers to control VOC emissions and acid mist eliminator to control emissions from electrowinning cells as RACT.

Roadbase Crushing and Screening Unit: The crushing plant is a 700 tons per hour crushing and screening unit used to produce roadbase material for the haul roads. Enclosures are in place and water sprays are used where feasible.
DAQ accepts the practice of reducing particulate emissions with enclosures and water sprays as the most effective means in reducing emissions.

The sources reviewed for RACT at the CC are outlined below:

Tioga Heaters: Natural gas-fired heaters are used for comfort heating throughout the facility. The heaters use low NO_x burners and regular inspections are done to the units to ensure optimum combustion performance. All the heaters are rated at less than 5 MMBTU/hr.
DAQ accepts the use of good combustion practices as a means of controlling combustion emissions.

Hydraulic Roller Press: The hydraulic roll press is a testing operation for the purpose of evaluating different roll surface technologies and the efficacy compared to the existing grinding operation. Enclosures and water sprays are used to control fugitive particulate.
DAQ accepts the practice of reducing particulate emissions with enclosures and water sprays as the most effective means in reducing particulate emissions.

Pebble Crushers and Associated Transfer Points: The facility has three crushers to handle pebbles exiting the semi-autogenous grinding (SAG) mill that are greater than 5/8-inch diameter and require further size reduction before they can be pumped to the cyclone circuits. Enclosures are in place and water sprays are used where feasible.
DAQ accepts the practice of reducing particulate emissions with enclosures and water sprays as the most effective means in reducing particulate emissions.

Product Dryer Heater: Natural gas-fired heater is used for Molybdenite Drying. The heater is rated at less than 5 MMBTU/hr. The heater is equipped with low NO_x burners and regularly inspected for optimum combustion performance.
DAQ accepts the use of low NO_x burners and good combustion practices to control NO_x, $PM_{2.5}$, SO_2, CO, and VOC emissions from heaters.